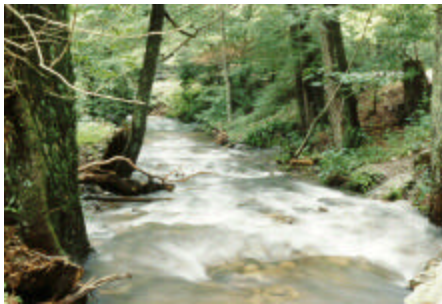


## INTRODUCTION



Forests cover 13.3 million acres of Tennessee, which provide wood, clean water, wildlife habitat, outdoor recreation and beauty to our state. Private, non-industrial landowners control 80 percent of Tennessee's forestland. Wood products manufacturing is one of Tennessee's largest industries. Considering both direct and indirect economic impacts, it adds about 17.1 billion dollars to the state's economy each year and employs about 163,000 Tennesseans. Wood delivered to the mills is one of Tennessee's most valuable crops. The Tennessee Nonpoint Source Program, NPS, has developed a Forestry Working Group with many agencies working as cooperative partners. Long Term goals and action items related to silvicultural activities are listed on page 1-6-8.

## EXTENT OF PROBLEM

Forestry-generated nps pollution represents a minor part of the total nps load in the State. The potential for forestry nps pollution is greatest from activities related to timber harvesting and reforestation. Timber haul roads, skid trails, log landings, and mechanically site-prepared areas are sites where the potential for soil movement is greatest.

The combined area subject to timber harvesting is estimated to be approximately 250,000 acres annually. The total area of mechanical site preparation, an activity where potential for considerable soil movement exists, continues to decline in favor of less costly and less persistent herbicides used for control of competing vegetation in softwood reforestation and release.

Logging and other silvicultural operations still affect only a small fraction (less than 3 percent) of the total commercial forest acreage of the State annually. The average size of these operations is relatively small (@50 acres) and widely dispersed across the landscape. Typical operations are temporary, lasting only a few days or weeks, and intervals between entries into the same areas are widely spaced, normally 20 to 50 years. While some forestry water quality problem events occur, no watersheds or streams can be singled out as having chronic or lasting water quality problems traceable to forestry activities. Overall, forestry activities in Tennessee affect water quality to a minor degree. The 1998 303(d) List reports four waterbodies as impacted by silviculture. Among these waterbodies approximately 57.5 miles are listed as partially supporting and 1.7 miles as not supporting.

### 1998 303(d) list with Silviculture as a pollutant source

#### Lower Duck River Basin

Waterbody ID	Impacted Waterbody
TN06040003041	LICK CREEK From N. Fork Locke Br to Walker Hill Rd is partial. Tribs are not supporting.

#### South Fork of the Cumberland River Basin

TN05130104026	CLEAR FORK RIVER – Crooked Cr from mile 14.6 to 33.0 is partially.
TN05130104038	BRIMSTONE CREEK – Above Mill Cr is partial.

#### Emory River Basin

TN06010208005	GREASY CREEK
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## SOLUTIONS

### Best Management Practices

A BMP Manual: Guide to Forestry Best Management Practices, was produced in 1993. This document contains the BMPs that are recommended by TDA, Forestry Division to lessen the environmental impact of forest management activities. BMPs developed for forestry activities in the mid-1980s have, by all indications, been effective for their purpose. The BMP Manual is currently in the process of being revised.

### Research to Test BMP Effectiveness

A joint research project between the of Forestry Division, Tennessee Wildlife Resources Agency, and the Center for Management, Utilization, and Protection of Water Resources at Tennessee Technological University (TTU) was conducted on an undisturbed watershed on Pickett State Forest during the period 1987 to 1990. The research objective was to determine the effectiveness of forestry BMPs applied when tree stands were clear-cut and naturally regenerated.

TTU researchers found virtually no detectable changes in water quality of streams in the area and concluded that BMPs, when correctly applied, can prevent water pollution from sediment generated on access roads, skid trails, and log landings and from herbicides applied in harvested stands. The research project concluded that the forestry BMPs tested are generally adequate, if properly used.

### Documenting Use of Best Management Practices

In 1992, the Forestry Division conducted an initial investigation of 150 logging operations throughout the state to determine the extent of BMP use as a relative measure of the effectiveness of BMP education and training efforts. Results showed although many loggers were familiar with BMPs, many were not using them. Even so, sediment delivery to streams was found to be a problem in relatively few operations.

It was concluded that the Division's Water Quality Program (<http://www.state.tn.us/agriculture/forestry/tdfbp.html>) had been reasonably successful in creating awareness in the forestry community about water quality as an issue and the



need to apply BMPs. Increased forestry activities would require the addition of a technical assistance component to demonstrate use of BMPs to individual landowners, loggers, and other operators.

Best Management Practices implementation rate is the barometer used to judge the effectiveness of TDA-Forestry's NPS management program. BMP implementation surveys have been conducted in 1993 and 1996. Implementation rates for these surveys were 50% and 63% respectively. A new survey is being planned for 2000. The program's targeted BMP implementation goal is 75% by 2005 and 80% by 2010. These surveys prove invaluable for assessing progress toward targeted rates. Future surveys will also be formatted to evaluate differences in BMP implementation between relevant sample groupings (i.e.: master logger vs. non-master logger, industry lands vs. private lands, etc.).

In 1995, a new BMP implementation survey procedure was developed to more objectively document the application of BMPs on logging, site preparation, and prescribed burning operations. In 1996, 200 operations were surveyed using the new procedure. The overall rate of implementation (use) was 62.9 percent.

In 1999, the University of Tennessee completed a field evaluation of BMP use on 191 harvesting operations on nonindustrial private forestlands. The evaluation tried to document BMP implementation by Master Loggers (<http://www.state.tn.us/agriculture/forestry/tdfml.html>). Twenty percent of the harvesting jobs were conducted by Master Logger graduates. Master logger's scored on average 75 percent, as opposed to an average score of 60 percent for loggers who had not yet attended the education program.

## COOPERATING PARTNERS

### Partners

Tennessee Association of Conservation Districts  
Tennessee Department of Agriculture  
    Ag Resource Conservation Fund  
Tennessee Department of Agriculture  
    Forestry Division  
Tennessee Department of Environment and Conservation  
    Division of Water Pollution Control  
Tennessee Forestry Association  
Tennessee Resource Conservation and Development  
    Councils  
Tennessee Wildlife Resources Agency  
University of Tennessee, Knoxville  
    UT Institution of Agricultural Services  
US Cherokee National Forest  
US Forest Service

### Abbreviation

TACD  
TDA-ARC  
  
TDA-Division of  
Forestry  
TDEC-WPC  
  
TFA  
TN RC&D  
  
TWRA  
  
UTIA  
USCNF  
USFS

### **Tennessee Association of Conservation Districts (TACD)**

TDA-ARC funds have been made available for cost share to each soil conservation district to fund tree plantings.



### **Tennessee Department of Agriculture–Ag Resource Conservation Fund (TDA-ARC)**

This fund helps fund two initiatives by the TDA-Forestry Division: 1) Tennessee Reforestation Incentive Program, TRIP. TRIP is an incentive program for landowners for tree planting in barren unproductive lands and 2) Agriculture Resource Conservation Program which funds the installation of BMPs in forest areas, planting riparian buffer zones and planting bottom land hardwood trees.

### **Tennessee Department of Agriculture, Forestry Division**

The Forestry Division's water quality program goal is to **prevent water pollution caused by forestry and other activities in forested areas**. Objectives to achieve the program goal include:

- Educate the forestry community regarding the use of BMPs.
- Provide technical assistance concerning BMP application.
- Monitor BMP use.
- Assist other agencies in resolving water quality problems

Encouraging BMP use, educating the forestry community, evaluating BMP use, and investigating water quality complaints continue to be the biggest challenges facing the Forestry Division's water quality program.

### **Tennessee Department of Environment and Conservation – Division of Water Pollution Control (TDEC-WPC)**

The Division of Water Pollution Control is responsible for the administration of the Tennessee Water Quality Control Act of 1977 (T.C.A. 69-3-101). Based on this authority, TDEC-WPC is the primary partner with the Forestry Division in investigating and resolving water quality complaints associated with silvicultural operations.

### **Tennessee Forestry Association (TFA)**

The TFA is a major partner in the Master Logger Program. The mission of the TFA is to promote the understanding of and appreciation for forests and related resources of Tennessee and their development for the benefit of all citizens of the state. Toward that end they:

- Educate the public about the wisdom of sustainable forest management.
- Advocate forest practices that conserve forest, soil, water, aesthetic, and wildlife resources.
- Promote the use of forest products for the economic well being of the state.
- Support legislation in the interest of scientific forest management.
- Provide landowners with information about the benefits and responsibilities of forest stewardship, and
- Advocate about the right of private landowners to responsibly manage their land.

### **Tennessee Master logger Program** (<http://www.tenfor.org/logger.html>)

The Tennessee Master Logger Program is designed to improve the health and management of forest resources while improving logger safety practices and business management skills. The Master Logger Program is open to all loggers



harvesting timber in Tennessee and surrounding states. Foresters and timberland owners may also attend. The Program consists of a five-day training course. One day of training is given once every two weeks for ten weeks.

The course has five sections: Logger Safety, Forest Ecology/Best Management Practices, Forest and Wildlife Management, First Aid and Business Management

#### **Tennessee Resource Conservation and Development Councils (TN RC&D)**

The RC&D Councils help educate the public about forestry BMPs.

#### **Tennessee Wildlife Resources Agency (TWRA)**

TWRA is a partner in the Forest Stewardship Program. It also manages several wildlife management areas across the state.

#### **University of Tennessee, Knoxville – U.T. Institute of Agriculture (UTIA)**

UTAES are partners in the Master Logger program and are actively involved in BMPs education.

#### **U.S. Forest Service (USFS)**

The U.S. Forest Service gives TDA-Forestry Division grant funds for landowner assistance such as the Forest Stewardship Program that involves land management for multiple uses. Protection of water quality and use of BMPs are key elements of these landowner assistance activities.

#### **Cherokee National Forest (CNF)**

Standards and guidelines (BMPs) to protect water quality are used during all management activities on the Cherokee National Forest. Forestry-related standards and guidelines closely mirror the best management practices developed by the State of Tennessee. A Memorandum of Understanding addressing nonpoint source pollution and BMP design and use between the State of Tennessee and the USDA, Forest Service, Cherokee National Forest was entered into in 1997. TDA, Division of Forestry works closely with USNF and makes comments on their forest plans.

#### **Land Between the Lakes**

Administration of Land Between the Lakes has recently been transferred from TVA to the U.S. Forestry Service. This change will allow similar partnerships as entered with the Cherokee National Forest.

## **OTHER FUNDING SOURCES**

Additional funding sources for environmental projects are listed in the Catalog of Federal Funding, which can be found at: [www.aspe.os.dhhs.gov/cfda](http://www.aspe.os.dhhs.gov/cfda)

## **CURRENT 319 PROJECTS**

#### **Tennessee Department of Agriculture, Forestry Division**

Tennessee's current 319 NPS Forestry Plan, developed in 1988, incorporated many of the strategies prescribed in the State's previously developed 208 Forestry Plan. Major objectives included (1), gaining widespread support from within the forestry community for implementing the water quality program, and (2), informing and training natural



resource professionals, forest managers and operators, and landowners regarding the potentials for water pollution caused by forestry activities and use of BMPs. An additional objective for the next 5 years will be to educate loggers, landowners, and foresters to the procedures involved with investigating water quality complaints and potential penalties if water quality problems are not resolved.

These objectives were strongly supported and substantially accomplished. To demonstrate support for the Program, government agencies, wood-using industries, conservation organizations, and private consultants made themselves and their employees available for training, adopted BMPs for use on their own lands, furnished technical assistance to forest operators and landowners, and assisted the Division in other ways to help make the Program a success.

The task of informing and training members of the forestry community was formidable. Several publications were developed including BMP handbooks, a brochure about the Water Quality Program, and a BMP videotape. In addition, a Forest Water Quality Newsletter is published quarterly.

From May 1988 through February 1995, the Division conducted 190 group training conferences concerning protection of water quality and use of BMPs for more than 4,000 resource managers, woods workers, and landowners at numerous locations throughout the State. Presentation of this session was only possible with the strong support of the wood-using industries and other natural resource agencies.

In 1992, the Tennessee Master Logger Program (MLP) was created to provide loggers with continuing education opportunities in logger safety, first aid, forest management techniques, BMPs, and how to manage a successful business. As part of this Program, loggers are provided intensive training in how to implement BMPs, along with the opportunity to evaluate BMPs on actual logging operations. Since the inception of the Master Logger Program, more than 1,195 loggers have completed the five-day course. (See the following section for Tennessee Master Logger Program <http://www.state.tn.us/agriculture/forestry/tdfml.html>)

In 1995, the Division's **Logger Contact Program** was established to (1) *develop and improve working relationships with loggers*, and (2) *provide loggers technical assistance in the application of BMPs*. By the end of 1998, over 1,284 logging contractors had been contacted by Division foresters. Of this total, 500 were new, first-time contacts. These site visits represented over 125,000 acres affected by logging operations.

During the winter of 1998, 241 forest technicians and aides completed a three-day training course, enabling them to provide assistance to Division foresters in contacting loggers and providing BMP technical assistance.

#### History of 319(h) Funding

FY	Grant Amount	Recipient	Purpose
FY92	\$30,000	TDA Forestry	BMP Training/Education
FY93	\$30,000	TDA Forestry	BMP Training/Education
FY94	\$30,000	TDA Forestry	BMP Training/Education
FY95	\$30,000	TDA Forestry	BMP Training/Education
FY96	\$80,000	TDA Forestry	BMP Training/Education





FY97	\$80,000	TDA Forestry	BMP Training/Education
FY98	\$80,000	TDA Forestry	BMP Training/Education
FY99	\$80,000	TDA Forestry	BMP Training/Education

## AREAS FOR PROGRAM EXPANSION

- Additional BMP education and technical assistance, including increased participation in Tennessee's Master Logger Program, is needed for greater BMP use among forest landowners and loggers.
- Establish additional BMP demonstration sites on State Forests.
- Increase progress toward the goal of 80 percent BMP implementation on forestlands.
- Increase work group activity to provide a forum to discuss progress.

## ENFORCEMENT MECHANISMS

Section 69-3-120 (g), Tennessee Code Annotated, exempts agricultural and forestry activities from regulation "unless there is a point-source discharge from a discernible, discrete, water conveyance." Accordingly, Tennessee's 319 Silvicultural NPS Program is operated as a non-regulatory program. This approach is consistent with most of the other state forestry NPS programs in the Southeast.

### Complaints

One measure of public awareness and concern about nps pollution caused by forestry activities is the number of complaints received by the Forestry Division, Department of Environment and Conservation, and Tennessee Wildlife Resources Agency. A Memorandum of Agreement was formalized between the TDEC-WPC and the TDA-Forestry Division in April 1987. In this agreement, the TDA-Forestry Division agreed to investigate complaints alleging nps pollution damage from failure to use BMPs in forestry operations and report to WPC regarding the findings of the TDA-Forestry Division investigator. Since 1994, the TDA-Forestry Division investigated 254 complaints arising from silvicultural operations.

In July 1995 a new Memorandum of Understanding (MOU) was signed between the TDEC-WPC and the TDA that superseded and updated the former agreement. This new MOU better defined the relationship between TDEC-WPC and TDA-Forestry Division relative to addressing pollution from silvicultural activities. In addition, written procedures were developed for TDA-Forestry Division personnel in conducting formal investigations of complaints. Emphasis is placed on correcting improper practices and furnishing information and assistance on proper BMP application; however, provisions exist to refer instances involving operators' refusal to comply with the Division of Water Pollution Control for possible enforcement actions.

In 1997, Senate Joint Resolution No. 230 established the Forest Management Advisory Panel (see <http://www.state.tn.us/agriculture/forestry/tfc/rec1.htm> for more details). The Resolution identified 35 separate organizations. Beginning in November of 1997, the Panel held 11 monthly two-day meetings. The Panel was charged with evaluating and recommending, "appropriate policy and programs that promotes forest sustainability and sound stewardship of all Tennessee forest lands." The panel articulated 11 goal areas



that are essential if Tennessee's forests are to be used and managed in a sustainable manner. The Panel endorsed 28 majority recommendations and 24 minority recommendations. Panel recommendations addressed all aspects of forestry, including water quality. Water quality specific recommendations included continued support of Best Management Practices compliance through voluntary practices and to strengthen and enforce consequences or disincentives for loggers who violate water quality laws.

In January 1999, an additional memorandum of agreement was signed between the TDEC-WPC and the TDA-Forestry Division (<http://www.state.tn.us/environment/epo/badactor.htm>). This policy was developed in part as a response to recommendations from the Forest Management Advisory Panel on "bad actors" in forestry operations. Through their research and discussions, the panel had identified a need to penalize forestry operators who blatantly or habitually violate water quality laws.

The purpose of this policy is to use the authority of the Water Quality Control Act of 1977 to address "bad actors" in forestry operations; to encourage Best Management Practices (BMPs) and to assure the protection of public health, the environment and the waters of the state. The violator will be required to attend and successfully complete the Master Logger training program or equivalent educational program in order to continue operations in Tennessee.

## MEASURES OF SUCCESS

- Increase the number of loggers trained each year.
- Number of BMPs recommended increases annually.
- Increased BMP implementation rate.

## MILESTONES

### Long Term Goal 1.

***Hold regularly scheduled meetings with stakeholders, to create new partnerships, to strengthen existing partnerships, and to foster greater trust, commitment and accountability.***

- **Action 1:** The Forestry Working Group (FWG) will meet semi-annually.  
Lead: TDA-Forestry Division  
Key partners: TFA; TWRA; TACD; TDEC-WPC; TNRC&D; UTIA; USFS; USDA-NRCS; TDA-NPS Program  
Year(s): 2001 – 2005
- **Action 2:** Increase FWG membership by one member each year.  
Lead: TDA-NPS Program  
Key partners: TFA; TWRA; TACD; TDEC-WPC; TNRC&D; UTIA; USFS; USDA-NRCS; TDA-NPS Program  
Year(s): 2001 – 2005





- **Action 3:** Establish the FWG mission statement, a list of collective capabilities, and priorities for funding.  
Lead Agencies: FWG and TDA-Forestry Division  
Key partners: TFA; TWRA; TACD; TDEC-WPC; TNRC&D; UTIA; USFS; USDA-NRCS; TDA-NPS Program  
Year(s): 2001-2005
- **Action 4:** Develop Memoranda of Agreement with key federal agencies to improve programmatic consistency.  
Lead: TDA-NPS Program  
Key Partners: All federal agency partners  
Year(s): 2001-2005

### **Long Term Goal 2.**

***Fully implement all developed TMDLs for nonpoint sources in compliance with existing regulations, policies, or agreements by 2015.***

Refer to Chapter 1.11, TMDL Implementation for specific action items related to this Long Term Goal.

### **Long Term Goal 3.**

***Restore all waters impaired by nonpoint sources that are listed on the 1998 303(d) List to the condition of fully supporting their designated uses by 2015, in cooperation with local, state and federal partners.***

- **Action 1:** 20% of the streams impaired due to silviculture on the 1998 303(d) List will support their designated uses.  
Lead Agencies: TDA-Forestry Division and TDA-NPS Program  
Key partners: TFA; TWRA; TACD; TDEC-WPC; TNRC&D; UTIA; USFS; USDA-NRCS  
Year(s): 2005
- **Action 2:** 60% of the streams impaired due to silviculture on the 1998 303(d) List will support their designated uses.  
Lead Agencies: TDA-Forestry Division and TDA-NPS Program  
Key partners: TFA; TWRA; TACD; TDEC-WPC; TNRC&D; UTIA; USFS; USDA-NRCS  
Year(s): 2010

### **Long Term Goal 4.**

***Beginning in 2006, through regulatory and non-regulatory means, prevent previously unlisted waters from being included on the 303(d) List because of nonpoint source impairments.***

- **Action 1:** Attain the BMP use-rate goal of 75 percent in forestry operations.  
Lead: TDA-Division of Forestry  
Year(s): 2005
- **Action 2:** Attain the BMP use-rate goal of 80 percent in forestry operations.  
Lead: TDA- Division of Forestry  
Year(s): 2010

- **Action 3:** Evaluate annually, if necessary, the Memorandum of Agreement between the TDEC and TDA regarding investigation of complaints about forestry operations.  
Lead: TDEC-WPC and TDA-Division of Forestry  
Key partners: TDA-NPS Program; TFA  
Year(s): 2001 - 2005

## **Long Term Goal 5.**

***Improve the knowledge of stakeholders and citizens concerning the origins, magnitude, and prevention of nonpoint source pollution, and how to prevent it.***

- **Action 1:** Conduct on-site visits with loggers and other forest operators and furnish technical assistance concerning application of BMPs.  
Lead: TDA-Forestry Division; TFA; UTIA  
Key partners: TDA-NPS Program; FWG  
Year(s): 2001-2005
- **Action 2:** Conduct forestry water quality and BMP familiarization and training conferences for resource managers, forest operators, and landowners.  
Lead: TDA-Forestry Division; TFA; UTIA  
Key partners: TDA-NPS Program; FWG  
Year(s): 2001-2005
- **Action 3:** Conduct 60 forest water quality and BMP training components of the Master Logger Program.  
Lead: TDA-Forestry Division; TFA; UTIA  
Key partners: TDA-NPS Program; FWG  
Year(s): 2001-2005
- **Action 4:** Conduct 50 continuing education training courses for master loggers.  
Lead: TDA-Forestry Division; TFA; UTIA  
Key partners: TDA-NPS Program; FWG  
Year(s): 2001-2005
- **Action 5:** Conduct riparian forest protection, restoration, and management course for TDA-Forestry Division foresters.  
Lead: TDA-Forestry Division; TFA; UTIA  
Key partners: TDA-NPS Program; FWG  
Year(s): 2001-2005
- **Action 6:** Update and publish a BMP Manual for forestry activities.  
Lead: TDA-Forestry Division; TFA; UTIA  
Key partners: TDA-NPS Program; FWG  
Year(s): 2001-2005



- **Action 7:** Publish four issues annually of Water Quality Newsletter.  
Lead: TDA-Forestry Division; TFA; UTIA  
Key partners: TDA-NPS Program; FWG  
Year(s): 2001-2005
- **Action 8:** Continue to educate loggers, landowners, and foresters to the procedures involved with investigating water quality complaints and potential penalties if water quality problems are not resolved.  
Lead: TDA-Forestry Division and TFA  
Key partners: TDA-NPS Program  
Year(s): 2001-2005
- **Action 9:** Create one new Forestry related educational project biennially  
Lead: TDA-Forestry Division and FWG  
Key partners: TDA-NPS Program  
Year(s): 2005
- **Action 10:** Establish a riparian zone education initiative to forest landowners.  
Lead: TDA-NPS Program  
Key partners: FWG  
Year(s): By 2005
- **Action 11:** Develop at least six Forestry BMP demonstration projects on state forestland.  
Lead: TDA-Forestry Division and FWG  
Key partners: TDA-NPS Program  
Year(s): By 2005

### **Long Term Goal 6.**

***Through the process of continuous improvement, routinely assess all programmatic functions of the TDA-NPS Program in order to maximize efficiency, decrease the bureaucratic burden and increase the numbers of participants in the program.***

- **Action 1:** Investigate other funding sources such as The Nature Conservancy, Brownfields Program, as well as EPA.  
Lead: TDA-NPS Program  
Key partners: The Nature Conservancy; US EPA  
Year(s): 2001-2005
- **Action 2:** Request feedback from partners annually to assess the quality of the services provided by the TDA-NPS Program.  
Lead: TDA-NPS Program  
Year(s): 2001-2005

### **Long Term Goal 7.**

***Use the maximum allowable percentage of funding annually to assist partners with water quality monitoring and assessment, for the duration of the 319 program.***

See Chapter 1.9 for action items related to water quality monitoring for the TDA-NPS Program.